REMARKS

The final Office Action dated December 16, 2002, was carefully reviewed. Claims 1, 5, and 8 are amended. Claims 1-18 remain in the application. It is respectfully requested the Examiner reconsider the present application in light of the amendments and remarks herein.

The Examiner objected to the amendment filed October 2, 2002 by asserting it introduces new matter to the disclosure. The Examiner asserted that the added material not supported in the disclosure is as follows: "A resonator plane" and "an electrode plane adjacent said resonator plane" in claims 1, 5, and 8; "an axis of natural vibration" in claims 1 and 8; "applied to an electrode to produce a force perpendicular to the electrode plane" in claims 1 and 8; and "applied to an electrode to produce a force perpendicular to the electrode plane" in claims 5 and 8.

Each of these will be addressed individually hereinafter

"A resonator plane" and "an electrode plane adjacent said resonator plane" has been objected to as new matter. It is respectfully asserted that the description referred to above has been added to the preamble of the claim in order to more clearly define the structure of a known micro-gyroscope in order to more clearly define the method of the present invention as it applies to the micro-gyroscope.

The background of the invention clearly defines the micro-gyroscope that is controlled by the method of the present invention. See page 1, lines 14-25 of the specification that describes the cloverleaf micro-gyroscope as a planar resonator that has a post rigidly attached in a plane perpendicular to the plane of the silicon leaves,

and to a quartz base plate with a pattern of electrodes that coincides with the cloverleaf pattern of the silicon leaves.

The summary of the invention begins by describing the present invention as a method for alignment and tuning a cloverleaf micro-gyroscope, see page 2, lines 26 and 27. Further, Figures 1 and 2 clearly show the planar resonator and the electrodes in an adjacent electrode plane.

The detailed description of the preferred embodiments describes in detail the structure of the cloverleaf micro-gyroscope in connection with Figure 1. The resonator plate 14 that is suspended from an outer frame 16 has a planar structure. The four electrodes are shown in an electrode plane adjacent the resonator plate 14. The Examiner is referred to Figure 1 and page 4, lines 24-27 and page 5, lines 1-5. The electrode plane and the resonator plane are specifically discussed at page 6, lines 4-5.

The Examiner further asserted that "an axis of natural vibration" as in claims 1 and 8 is not supported in the specification. It is known in the art of cloverleaf micro-gyroscopes that a Coriolis force induces motion in the silicon leaves and is detected on the sense axis, or y-axis. See page 5, lines 6-13, which describe the Coriolis force induced about the y-axis, which is known in the art of micro-gyroscopes to be an axis of natural vibration. However, the claims currently reflect the term of the art. In order to use the term supported by the specification and not the terms in the art, claims 1 and 8 have been amended from "axis of natural vibration" to "sense axis". It is respectfully asserted that no new matter is presented herein.

The Examiner further asserted that "applied to an electrode to produce a force perpendicular to the electrode plane" in claims 1, 5 and 8 (two occurrences) is not fully supported by the specification. It is respectfully asserted that sufficient support can be found beginning at page 5, lines 11 and 12 where it is described that the displacement about the y-axis is due to the influence of rotation induced Coriolis force that needs to be restrained by a counteracting force.

The specification further describes that the present invention applies this counteracting force by an electrostatic bias adjustment applied to an electrode to introduce cross axis electrostatic stiffness (page 13, lines 20-21). The result of applying the electrostatic bias adjustment to an electrode (page 9, lines 18-19) is the production of a force perpendicular to the electrode plane, which is a counteracting force to the mechanical spring force. This force arises from the cross coupling electrostatic spring K^e_{xy}, see page 12, lines 9-16. In order to use the terms that are consistent with the specification, "perpendicular" has been amended to "cross axis."

In light of these explanations and in view of the Examiner's assertions, the claim amendments were made in order to avert the Examiner's objections and rejections under 35 U.S.C. § 112 and bring the claims into better condition for allowance.

It is respectfully requested the Examiner withdraw the objection to the specification and the rejection of claims 1-18 under 35 U.S.C. § 112 in light of the clarification provided herein.

Should the Examiner have any questions or comments that may place the application in better condition for allowance, he is respectfully requested to call the undersigned attorney.

Respectfully submitted,

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"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

In the claims:

Kindly substitute the following for pending claim 1:

1. (Amended) A method for aligning a cloverleaf micro-gyroscope having a resonator in a resonator plane, at least four electrodes in an electrode plane adjacent said resonator plane, and closed loop control of drive and output axes, said method comprising the steps of:

detecting misalignment of [an axis of natural vibration] a sense axis of said resonator relative to said drive axis; and

correcting misalignment to zero by an electrostatic bias adjustment applied to an electrode to produce a force [perpendicular] in cross axis to the electrode plane.

Kindly substitute the following for pending claim 5:

5. (Amended) A method for tuning a cloverleaf micro-gyroscope having a resonator in a resonator plane, at least four electrodes in an electrode plane adjacent said resonator plane, and closed loop control of drive and output axes, said method comprising the steps of:

detecting residual mistuning by way of a signal; and

correcting said residual mistuning to zero by way of electrostatic bias adjustment applied to an electrode to produce a force [perpendicular] in cross axis to the electrode plane.

Kindly substitute the following for pending claim 8:

8. (Amended) A method for independently aligning and tuning a cloverleaf micro-gyroscope having a resonator in a resonator plane, at least four electrodes in an electrode plane adjacent said resonator plane, and closed loop control of drive and output axes, said method comprising the steps of:

detecting misalignment of [an axis of natural vibration] a sense axis of said resonator relative to said drive axis; and

correcting misalignment to zero by an electrostatic bias adjustment applied to an electrode to produce a force [perpendicular] in cross axis to said electrode plane;

detecting a residual mistuning by way of a signal; and

correcting said residual mistuning by way of an electrostatic bias adjustment applied to an electrode to produce a force [perpendicular] in cross axis to said electrode plane.